Regency®

COMMUNICATIONS, INC.

SERVICE MANUAL

SPEECH COMPRESSOR AMP

MODEL MA-325

1227 S. PATRICK DRIVE
SATELLITE BEACH FL.

0300-4200-900

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SERVICE INSTRUCTIONS

REGENCY MA-325

SPEECH COMPRESSION AMP

I. GENERAL DESCRIPTION

The MA-325 Compression Amp Option is an amplitude-controlled audio band, pre amp. It can be used in either the UHF or VHF base station, in conjunction with a desk microphone. It replaces the MA-100 Option Board.

II. CIRCUIT DESCRIPTION

The incoming audio from the desk microphone enters the MA-325 at point U5 (see Schematic). It is attenuated by voltage divider network, R1 and R3, then coupled through C1 and R2 to input Pin 6 of IC1(B). The output of this first amplifier stage is taken from Pin 7 and fed through R5 to the input of amp IC1(A) at Pin 2. The gain and frequency response of this amp is controlled by R17 and C7. The output from Pin 1 is coupled through C4 and C5, rectified by CR1 and the resultant DC impressed on C6 as a positive value. This DC is used as a bias voltage and delivered to the common gates of FET Q1. Q1, connected in parallel with R4, controls the gain of amp IC1(B). As the output at Pin 7 increases in amplitude, the detected DC level at the junction of CR1, C6, R13 and R8 becomes more positive. This tends to turn on Q1 which decreases the gain of IC1(B), bringing the output at Pin 7 back down. The quiescent state of Q1, and therefor the total loop gain from U5 to U1, is determined by the adjustment of R15. R15 also controls the amount of compression (see Figure 3).

IC1(C) is a constant gain O/P amp, used to bring the compressed output of IC1(B) up to a level more compatible to the speech amps in the radios. C3, 9, 19, 11 and 13 are used for noise filtering. IC2 is an 8V DC regulator. It is fed +13.8 VDC through R.F. filter network L1 and C10. R20 and R21 form a voltage divider to get +4 VDC bias voltage.

III. INSTALLATION

Read through all installation steps before proceeding. Refer to Schematic and Layout Diagrams as necessary.

1. Remove two screws at rear of radio (see Figure 1) and slide chassis out front of the unit. Be careful to unplug wiring harness on right-hand inside of unit before removing chassis.

2. Mount MA-325 board on rear side of interconnect board at pre-drilled holes using 4/40 screws provided in installation kit (see Figure 2).

   a. Using a rubber eraser, insure that ground land around the two mounting holes on interconnect board is clean.
   b. Insure that screws are firmly torqued.

3. Connect JO1(red) to the PØ tie pin on main board and to PØ tie point on MA-325 board (see Figure 2).
4. Disconnect grey J-Flex cable from main board at point U1 and Gnd (see Figure 2).
5. Reconnect grey J-Flex to MA-325 board at point U1 and nearest ground (see Figure 3).
6. Using grey J-Flex cable supplied in kit (JO2), connect U1 and ground pins on main board to output pins at point U5 and ground on MA-325 board.
7. Slide chassis back into case far enough to reconnect power harness plug.
8. Set POT on MA-325 board to mid-range.

IV. ADJUSTMENT PROCEDURE

The following test and adjustments are made on the assumption that the basic radio is set up and adjusted according to standard Regency procedures as called out in the applicable manuals.

1. Plug radio AC power cord into wall receptacle.
2. Turn on radio; allow 30 seconds for warm-up.
3. Equipment needed:

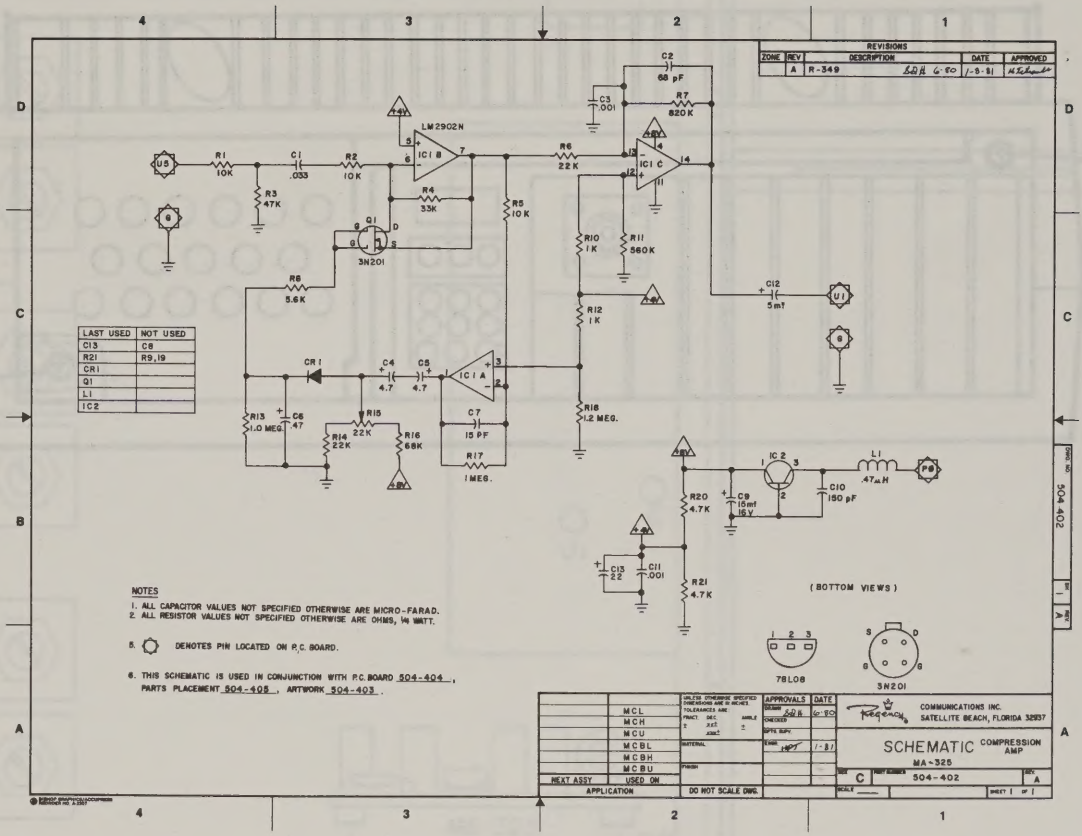
   a. Deviation meter
   b. Feed-thru attenuator

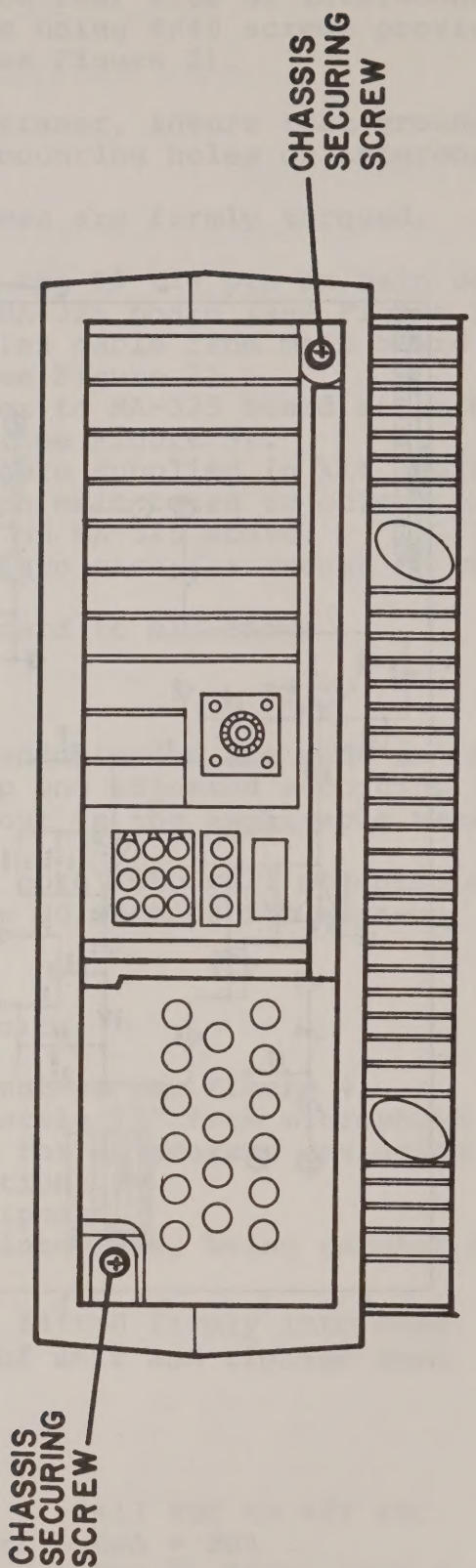
4. Hook up test equipment as per Figure 4.
5. With mouth approximately 12" from microphone, adjust POT on MA-325 board for an average deviation of 3 KHz for normal conversation.
6. Disconnect test equipment.
7. Slide chassis back into case, being careful not to pinch wires.

   a. When chassis is fitted firmly into case, replace two screws in rear of unit and tighten down.

V. SPECIFICATIONS

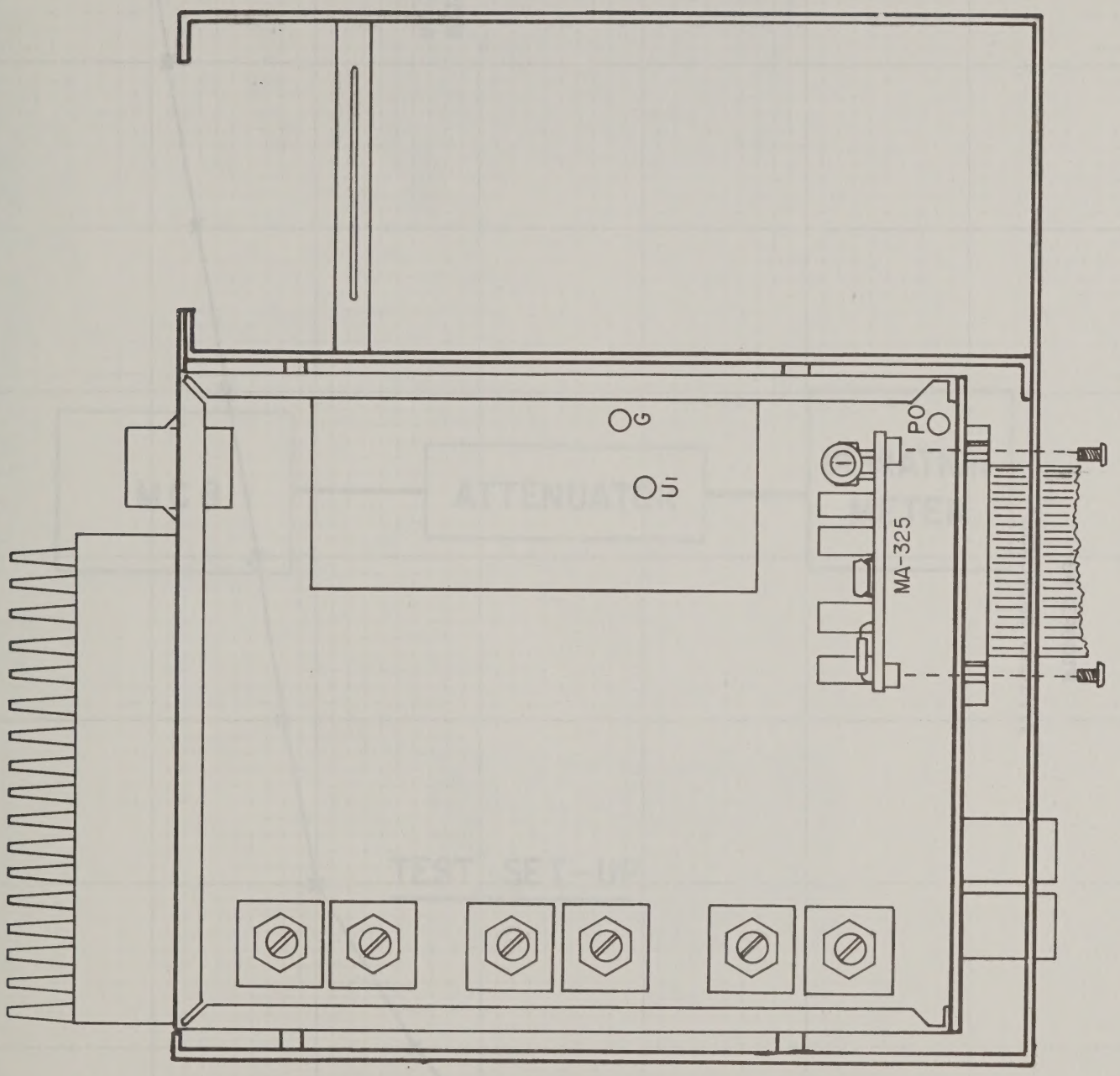
1.	Power supply	- +11 VDC to +24 VDC
2.	Power supply current	- 6mA + 20%
3.	Audio input	- 5mv to 500mv (POT @ mid-range)
4.	Compression range	- variable from 10dB to 40dB (see Fig.3)
5.	Operating temperature	- -30°C to +60°C


REVISIONS
ZONE REV DESCRIPTION DATE APPROVED
A R-349 LDR 6-80 1-9-81
LM2902N
IC1 B
IC1 C
IC1 A
IC2
3N201
78L08
R1 10K
C1 .033
R2 10K
R3 47K
R4 33K
R5 10K
R6 22K
R7 820K
R8 5.6K
R10 1K
R11 560K
R12 1K
R13 1.0 MEG.
R14 22K
R15 22K
R16 68K
R17 1 MEG.
R18 1.2 MEG.
R20 4.7K
R21 4.7K
C2 68 pF
C3 .001
C4 4.7
C5 4.7
C6 .47
C7 15 PF
C9 15mf 16V
C10 150 pF
C11 .001
C12 5mf
C13 22
CR1
L1 .47mH
P1
J1
LAST USED NOT USED
C13 C8
R21 R9, 19
CR1
Q1
L1
IC2
NOTES
1. ALL CAPACITOR VALUES NOT SPECIFIED OTHERWISE ARE MICRO-FARAD.
2. ALL RESISTOR VALUES NOT SPECIFIED OTHERWISE ARE OHMS, ¼ WATT.
5. DENOTES PIN LOCATED ON P.C. BOARD.
6. THIS SCHEMATIC IS USED IN CONJUNCTION WITH P.C. BOARD 504-404, PARTS PLACEMENT 504-405, ARTWORK 504-403.
(BOTTOM VIEWS)
APPROVALS DATE
DRAWN LDR 6-80
CHECKED
QA'S SUPV.
ENGR. 1-8-81
COMMUNICATIONS INC.
SATELLITE BEACH, FLORIDA 32937
SCHEMATIC COMPRESSION AMP
MA-325
SIZE C PART NUMBER 504-402 REV. A
SCALE SHEET 1 OF 1
MCL
MCH
MCU
MCBL
MCBH
MCBU
NEXT ASSY USED ON
APPLICATION
DO NOT SCALE DWG.



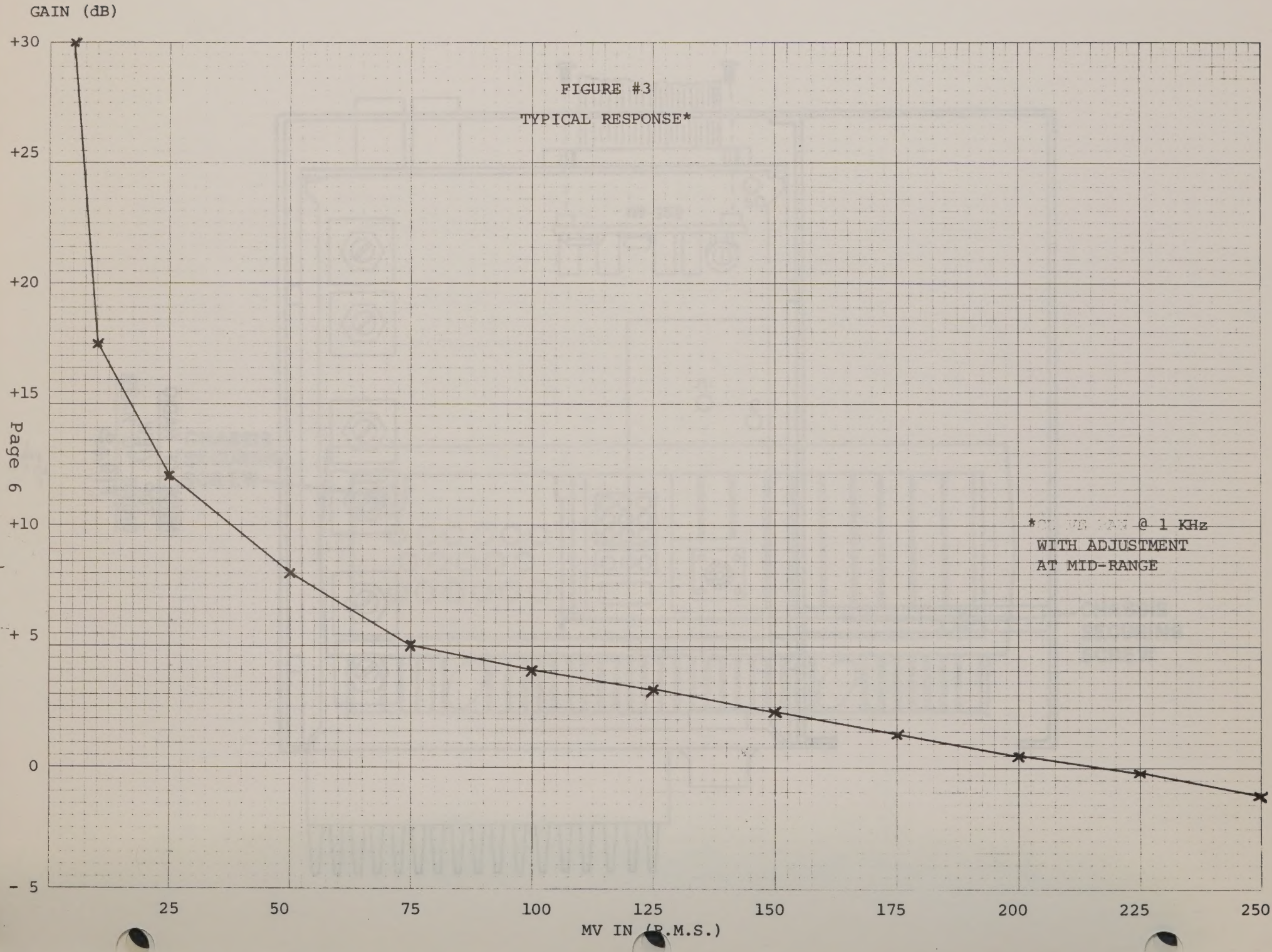
REAR OF RADIO

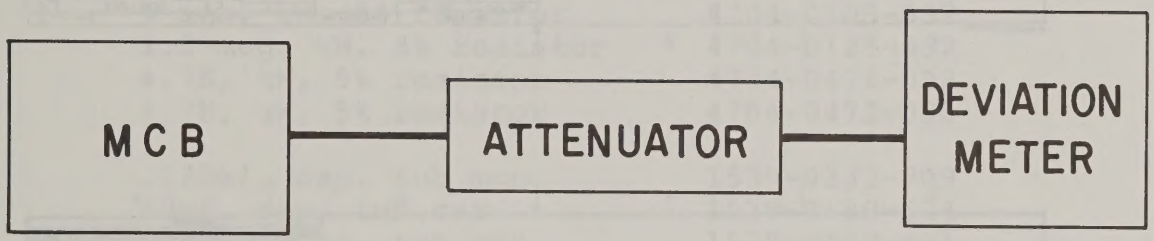
FIG. 1



INSIDE OF RADIO
TOP VIEW

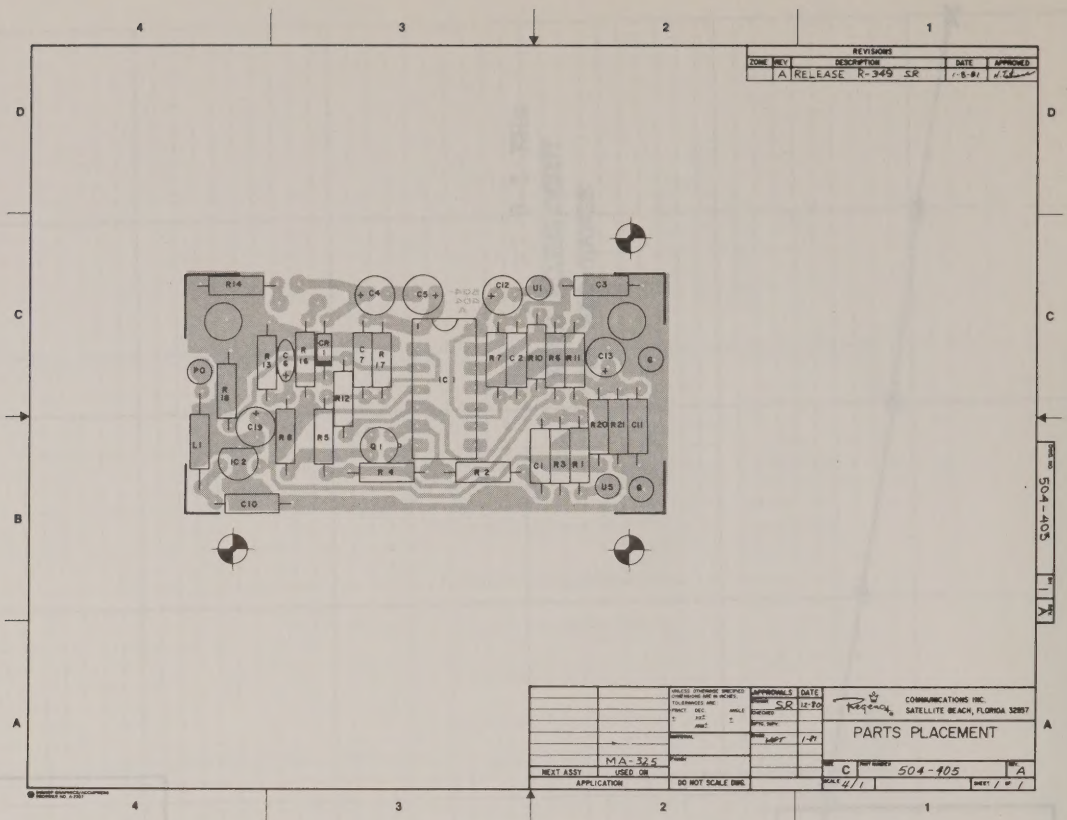
FIG. 2

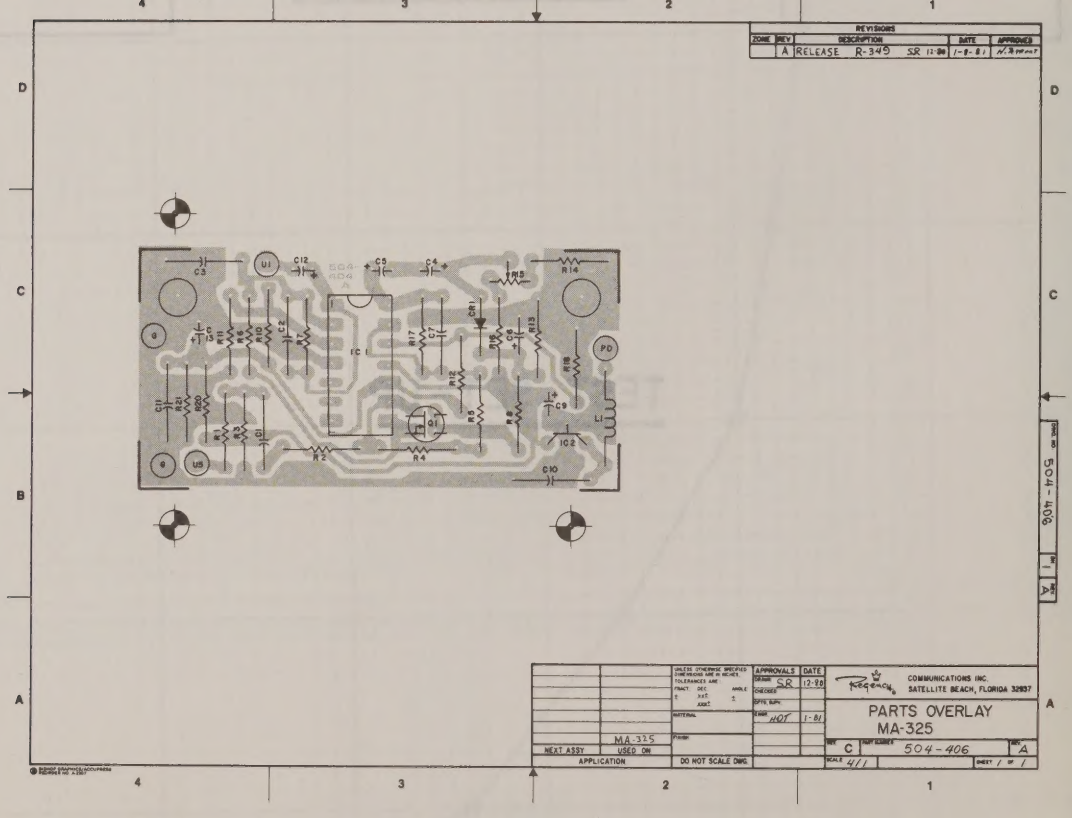

GAIN (dB)
+30
+25
+20
+15
+10
+ 5
0
- 5
25
50
75
100
125
150
175
200
225
250
MV IN (R.M.S.)
FIGURE #3
TYPICAL RESPONSE*
@ 1 KHz
WITH ADJUSTMENT
AT MID-RANGE



TEST SET-UP

FIG. 4


REVISIONS
ZONE REV DESCRIPTION DATE APPROVED
A RELEASE R-349 SR 1-8-81
504-405
COMMUNICATIONS INC.
SATELLITE BEACH, FLORIDA 32937
PARTS PLACEMENT
MA-325
504-405
A


REVISIONS
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A RELEASE R-349 SR 12-80 1-9-81
504-406
COMMUNICATIONS INC.
SATELLITE BEACH, FLORIDA 32937
PARTS OVERLAY
MA-325
504-406
A

PARTS LIST

MA-325

CIRCUIT NUMBER	DESCRIPTION	PART NUMBER	ZONE
R1	10K, ¼W, 5% resistor	4704-0103-032	D-4
R2	10K, ¼W, 5% resistor	4704-0103-032	D-3
R3	47K, ¼W, 5% resistor	4704-0473-032	D-4
R4	33K, ¼W, 5% resistor	4704-0333-032	D-3
R5	10K, ¼W, 5% resistor	4704-0103-032	D-3
R6	22K, ¼W, 5% resistor	4704-0223-032	D-2
R7	820K, ¼W, 5% resistor	4704-0824-032	D-2
R8	5.6K, ¼W, 5% resistor	4704-0562-032	C-3
R10	1K, ¼W, 5% resistor	4704-0102-032	C-2
R11	560K, ¼W, 5% resistor	4704-0564-032	C-2
R12	1K, ¼W, 5% resistor	4704-0102-032	C-2
R13	1 meg, ¼W, 5% resistor	4704-0105-032	B-4
R14	22K, ¼W, 5% resistor	4704-0223-032	B-3
R15	22K POT, VAR	4751-0223-002	B-3
R16	68K, ¼W, 5% resistor	4704-0683-032	B-3
R17	1 meg, ¼W, 5% resistor	4704-0105-032	B-3
R18	1.2 meg, ¼W, 5% resistor	4704-0125-032	B-2
R20	4.7K, ¼W, 5% resistor	4704-0472-032	B-2
R21	4.7K, ¼W, 5% resistor	4704-0472-032	B-2
C1	.033mf, cap. tub mon	1539-0333-809	D-4
C2	68mf, cap, tub cer	1538-0680-524	D-2
C3	.001mf, cap, tub cer	1538-0102-601	D-2
C4	4.7mf, 50V, cap	1513-0050-004	C-3
C5	4.7mf, 50V, cap	1513-0050-004	C-3
C6	.47mf, 15V cap tant	1515-0478-003	B-4
C7	15mf, 50V, cap tub cer	1538-0150-508	B-3
C9	15mf, @16V, cap	1513-0150-002	B-2
C10	150mf, 50V, cap tub cer	1538-0151-601	B-1
C11	.001mf, 50V, cap tub cer	1538-0102-601	B-2
C12	5mf, 50V, cap	1513-0050-004	C-2
C13	22mf, 10V, cap	1513-0220-001	B-2
CR1	diode, sil	4805-1241-200	C-3
Q1	dual MOS FET 3N201	4804-0870-890	C-3
IC1	Op amp, LM2902N	3130-3157-637	C,D-2,3
IC2	8V reg. 78L08	3130-0000-014	B-2
L1	Inductor, .47uh	1802-0478-006	B-1
	contact pin	2107-0000-003	(5 used)
	stand-off	2813-1240-623	(2 used)